

CLAIMS

What is claimed is:

1. An encapsulation method for a plurality of electronic devices within a mold cavity in an encapsulation device comprising:
providing a first substrate having a first side, a second side, and at least one electronic component on said first side of said first substrate;
providing a second substrate having a first side, second side, and at least one electronic component on said first side of said second substrate;
providing upper and lower mating mold plates, each mold plate of said upper and lower mating mold plates having a mold cavity portion, each said mold cavity portion of said upper and lower mating mold plates having a feed runner leading from a material supply to said each mold cavity portion and having a vent runner connected thereto for venting said each mold cavity portion, said each mold cavity portions together comprising said mold cavity portion of said encapsulation device;
placing said first substrate having said at least one electronic component on said first side thereof and said second substrate having said at least one electronic component on said first side thereof into said mold cavity portion, said first substrate and said second substrate each having said second side thereof being located between said upper and lower mating mold plates;
moving said upper and lower mating mold plates toward each other to form said mold cavity portion, portions of said upper mating mold plate engaging portions of said first surface of said first substrate and portions of said lower mating mold plate engaging portions of said first surface of said second substrate, said moving of said upper and lower mating mold plates toward each other causing said second side of said first substrate and said second side of said second substrate to have portions thereof in contact;
injecting a first material into said upper mold cavity portion and a second material into said lower mold cavity portion to separately encapsulate said at least one electronic component on said first side of said first substrate and said at least one electronic component on said

first side of said second substrate, said second material comprising one of the first material or a similar material; and
removing said first substrate and said second substrate from said upper and lower mating mold plates, said first substrate and said second substrate each having at least one encapsulated electronic component on said first side thereof.

2. The method of claim 1, wherein said injecting said second material into said lower mold cavity portion comprises injecting a material substantially identical to said first material.

3. The method of claim 1, wherein said injecting said second material into said lower mold cavity portion comprises injection of a material substantially different from said first material.

4. The method of claim 1, wherein said first material and said second material are injected substantially simultaneously.

5. The method of claim 1, wherein said first material and said second material are injected at different times.

6. The method of claim 1, further comprising cleaning said second side of each of said first substrate and said second substrate.

7. The method of claim 1, further comprising curing said plurality of electronic devices at an elevated curing temperature.

8. An encapsulation method for a plurality of electronic devices within a mold cavity of an encapsulation apparatus, said method comprising:

providing a first substrate having a first side, a second side, and at least one electronic component located on said first side of said first substrate;

providing a second substrate having a first side, a second side, and at least one electronic component located on said first side of said second substrate;

providing upper and lower mating mold plates, each mold plate of said upper and lower mating mold plates having a mold cavity portion, each said mold cavity portion of said upper and lower mating mold plates having a feed runner leading from a material supply to said each mold cavity portion and having a vent runner connected thereto for venting said each mold cavity portion, said each mold cavity portions together comprising said mold cavity of said encapsulation apparatus;

placing said first substrate having said at least one electronic component on said first side thereof and said second substrate having said at least one electronic component on said first side thereof into said mold cavity, said second side of said first substrate and said second side of said second substrate placed in a back-to-back orientation between said upper and lower mating mold plates;

moving said upper and lower mating mold plates to form said mold cavity portions of said upper mating mold plate engaging portions of said first side of said first substrate and portions of said lower mating mold plate engaging portions of said first side of said second substrate and causing said second side of said first substrate and said second side of said second substrate to have portions thereof in engagement;

injecting a first material into said mold cavity portion of said upper mating mold plate and a second material into said mold cavity portion of said lower mating mold plate to separately encapsulate said at least one electronic component mounted on said first side of each of said first and second substrates of said plurality of electronic devices, the second material comprising one of the first material and a similar material; and

removing said plurality of electronic devices from said mold cavity.

9. The method of claim 8, wherein said each mold cavity portion of said upper and lower mating mold plates is connected to a vent runner for venting said each mold cavity portion.

10. The method of claim 8, wherein the injecting said second material into said lower mold cavity portion comprises injection of a material substantially identical to said first material.

11. The method of claim 8, wherein the injecting said second material into said lower mold cavity portion comprises injection of a material substantially different from said first material.

12. The method of claim 8, wherein said first material and said second material are injected substantially simultaneously.

13. The method of claim 8, wherein said first material and said second material are injected at different times.

14. The method of claim 8, further comprising cleaning said second side of each of said first substrate and said second substrate.

15. The method of claim 8, further comprising subjecting said plurality of electronic devices to a curing temperature.

16. The method of claim 8, wherein said second side of each of said first substrate and said second substrate of said electronic device includes solder bumps thereon.